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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/634,302	08/04/2003	Michael Frank	PIX-P-033	7966

32566 7590 03/25/2008

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EXAMINER	
GILES, NICHOLAS G	
ART UNIT	**PAPER NUMBER**
2622	

MAIL DATE	DELIVERY MODE
03/25/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/634,302	FRANK ET AL.	
	Examiner	Art Unit	
	NICHOLAS G. GILES	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) *8-31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 March 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-31 have been considered but are moot in view of the new grounds of rejection.

Claim Rejections - 35 USC § 112

2. The rejections under 35 USC 112 are withdrawn as the claims have been amended.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims **1 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Horii et al. (U.S. Patent No. 6,573,931) in view of Yamada et al. (U.S. Patent No. 5,995,137) in further view of Fowler et al. (U.S. Patent No. 5,461,425) in further view of Ewedemi et al. (U.S. Pub. No. 2001/0040631).

Regarding claim **1**, Horii et al. discloses:

> A video imaging system, comprising: a digital image sensor for performing image capture operations (camera unit 150 Fig. 7, 1:38-43 and 8:2-4), comprising: a sensor array comprising a two-dimensional array of pixels, each pixel outputting signals as pixel data representing an image of a scene (image sensing element 103 Fig. 7, 1:48-54); an image buffer, in communication with

said sensor array, for storing said pixel data (data multiplexing and demultiplexing unit 115 Fig. 7, 2:1-8); a first processor, in communication with said image buffer and said sensor array, for controlling image capture and pixel data processing operations (System control unit 106 Fig. 7, 1:38-43); and a first interface circuit, in communication with said image buffer (connector 107 Fig. 7, 2:34-36), for transferring said pixel data onto a pixel bus (cable 109 Fig. 7 2:34-36); and a digital image processor for performing image processing operations (image processing unit 200 Fig. 7, 2:18-22), comprising: a second interface circuit coupled to receive said pixel data from said pixel bus (connector 230 Fig. 7); a frame buffer, in communication with said second interface circuit, coupled to store said pixel data (data multiplexing and demultiplexing unit 231 Fig. 7, 2:26-29); an image processing pipeline for processing said pixel data stored in said frame buffer into video data corresponding to a video format (signal processing circuit 202 and encoder 204 Fig. 7, 2:36-39 and 2:45-48); and a second processor, in communication with said frame buffer and said image processing pipeline, for directing said image processing pipeline to process said pixel data stored in said frame buffer (system control unit 250 Fig. 7, 2:18-22); wherein said digital image sensor and said digital image processor transfer control information over a control interface bus (data control line 113 and control data signal 222 Fig. 7, 2:8-14 and 3:4-8) and said digital image sensor performs said image capture operations independent of said image processing operations performed by said digital image processor (1:38-43, 2:18-22, 8:5-21).

Horii et al. is silent with regards to selecting the video format from a group of video formats. Yamada et al. discloses this in 6:38-42. Yamada discloses in 6:38-42 that an advantage to this is that a signal of a format determined by a desired TV standard system can be used. For this reason it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Horii et al. include selecting the video format from a group of video formats.

Horii et al. and Yamada et al. are silent with regards to using digital pixels. Fowler et al. discloses this in 2:46-54. Fowler et al. discloses in 2:8-10 that an advantage to doing this is that parasitic effects and distortion are minimized. For this reason it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Horii et al. using digital pixels.

Horii, Yamada, and Fowler are silent with regards to having separate control interface and pixel buses. Ewedemi et al. discloses this in ¶0033 where a pixel data bus 115 and control bus 116 are used for communicating between an image sensor and a separate image processing circuit. This is advantageous in that Horii would not have to mux and demux the signals thus allowing the signals to be provided directly to the destination circuit rather than having to go through the mux and demux process. For this reason it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Horii et al. include separate control interface and pixel buses.

Regarding claim **7**, see the rejection of claim 1 and note that Yamada et al. further discloses in 6:38-42 that the group of video formats is NTSC, PAL, and digital TV. Yamada discloses in 6:38-42 that an advantage to this is that a signal of a format determined by a desired TV standard system can be used. For this reason it would have been obvious to one of ordinary

skill in the art at the time the invention was made to have Horii et al. include that the group of video formats is NTSC, PAL, and digital TV.

5. Claims **2-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Horii et al. in view of Yamada et al. in further view of Fowler et al. in further view of Ewedemi et al. in further view of Tamama et al. (U.S. Pub. No. 2002/0135683).

Regarding claim **2**, see the rejection of claim 1 and note that Horii, Yamada, and Fowler are silent with regards to the image processing pipeline including an interpolator module that generates video data in three color planes and having a vertical resolution corresponding to a selected video format. Tamama et al. discloses:

> Image processing pipeline comprises an interpolator module, for interpolating said pixel data to generate video data in at least three color planes and having a vertical resolution corresponding to a selected video format (¶0095-0097, CFA interpolator 130 Fig. 1c).

Tamama et al. discloses in ¶0096 that doing this is advantageous because the missing pixel values at each location can be determined and a full color resolution image can be constructed. For this reason it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Horii et al. include the image processing pipeline including an interpolator module that generates video data in three color planes and having a vertical resolution corresponding to a selected video format.

Regarding claim **3**, see the rejection of claim 2 and note that Tamama et al. further discloses:

Image processing pipeline further comprises an image processing circuit coupled to receive said video data from said interpolator module and for performing image enhancement functions on said video data (¶0098-0101, tone correction 332 Fig. 1c).

Tamama et al. discloses in ¶0099 that this is advantageous because the illuminant is taken into account that compensating for the illuminate. For this reason it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Horii et al. include performing image enhancement functions on video data received by the interpolator module.

Regarding claim **4**, see the rejection of claim 2 and note that Tamama et al. further discloses:

Interpolator module performs vertical interpolation and demosaic operations on said pixel data (¶0095-0097 and 0385-0391).

Tamama et al. discloses in ¶0096 that doing this is advantageous because the missing pixel values at each location can be determined and a full color resolution image can be constructed. For this reason it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Horii et al. include vertical interpolation and demosaic operations.

Regarding claim **5**, see the rejection of claim 3 and note that Horii et al. further discloses:

Image processing circuit performs tone correction operations on said video data (white balance, 2:39-44).

Regarding claim **6**, see the rejection of claim 2 and note that Horii et al. was already shown to have an encoder in the rejection of claim 1. Also note that Yamada et al. was already

shown to select the video format from a group of video formats for encoding in claim 1. Lastly in 2:18-22 Horii et al. discloses the system control unit 250 controlling individual devices in image processing unit 200 which would include encoder 204 and the rest of the image processing pipeline.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICHOLAS G. GILES whose telephone number is (571)272-2824. The examiner can normally be reached on Monday through Friday from 7:30am to 4:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached on (571) 272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lin Ye/
Supervisory Patent Examiner, Art Unit 2622